4.3 CULTURAL RESOURCES

This section describes existing conditions within the project area, assesses Project impacts, and identifies mitigation measures that would avoid or reduce significant adverse impacts on cultural resources to a less than significant level. The study area for cultural resources includes all ground surfaces that would be affected at Moss Landing and all submerged surfaces along the proposed MARS offshore cable route.

4.3.1 Environmental Setting

Sea Route

A geophysical survey of the sea route was conducted by Fugro Seafloor Surveys, Inc., to acquire side-scan sonar imagery and sub-bottom profile information (Fugro 2004). Background research was conducted to identify, digitize, and plot the positions of all reported shipwrecks, shoals, rocks, pipelines and cable corridors, naval operating areas, offshore structures, buoys, beacons, and any other obstructions that might represent potential hazards to the cable. The positions of all charted shipwrecks mapped on various nautical charts were checked against the Global Maritime Wrecks Database (January 2001 Edition, Veridian). This database includes detailed information on 250,000 wrecks worldwide and its coverage includes the entire Californian coast.

Results of the Fugro background research indicate that no wrecks have been recorded near the sea route. The closest wreck identified in the geophysical survey data is located approximately 850 feet (260 m) northeast of the route (Fugro 2004). In addition, side-scan sonar images collected during the geophysical survey identify the Duke Energy Oil pipeline as well as several additional sonar contacts nearby that appear to represent small man-made objects that are consistent with anchor blocks for old mooring buoys or other debris of an unknown nature (Fugro 2004).

These conclusions are consistent with results of the *Marine Cultural Resource Inventory and Avoidance Plan for the Global West Fiber Optic Cable Project* (SAIC 2000), a report prepared by MacFarlane Archaeological Consultants in compliance with a mitigation measure in the Global West EIR (CSLC 2000). That marine inventory covered an area that included virtually the entire Project sea route, although it focused on the route of the Global West cable in particular (SAIC 2000). Shipwreck locations identified in the Global West marine inventory were identified from existing cultural resource inventories provided by the California State Lands Commission (CSLC) and the U.S. Minerals Management Service (MMS) (MMS 1987, 1990). MacFarlane Archaeological Consultants database was compiled from these as well as other sources, e.g., the San

Francisco Maritime Museum and the National Archives in San Bruno, California and Washington, D.C.

A comparison of the Project sea route and potential shipwreck locations mapped in the Global West marine inventory (Figure I-4 in Appendix I of SAIC [2000]) shows that the Project sea route avoids the known locations of potential shipwrecks, but also indicates the widespread presence of other shipwreck sites in the area, and suggests the potential for the presence of yet-unidentified shipwreck sites in the Project vicinity; this figure is included in Appendix E (Confidential).

While the parameters employed in the Fugro geophysical survey provide acceptable levels and qualities of data for interpretation and analysis of the geophysical constituents of the seafloor, in and of themselves they are not sufficient to conclusively identify and interpret potential submerged cultural resources. In addition, the suite of remote sensing instrumentation was incomplete, as a magnetometer was not deployed on any of the survey transects (Fugro 2004:51). This is a standard piece of equipment deployed on most marine cultural resource surveys conducted by Federal agencies, such as the Minerals Management Service, the National Park Service, and NOAA. Consequently, that data set is not available for correlation with any potential targets identified in either the geophysical survey's side scan sonar or sub-bottom profiler data.

To evaluate whether additional remote sensing data would be required to ensure that potential submerged cultural resources in the offshore project area are located and avoided during cable installation and removal, additional data were reviewed and analyzed. The data were reviewed to assess the likelihood that bottom sediments along the proposed cable route are sufficiently thick to contain buried historic cultural resources that were not detected during Fugro's sub-bottom profiler and side scan sonar surveys. The analysis was also conducted to determine whether a magnetometer survey should be performed along the cable route to identify buried historic or prehistoric cultural material. Information reviewed as part of this analysis includes data in Section 4.4 of this EIR/EIS, as well as a memo prepared by Fugro Engineers B.V. entitled "Additional Burial Assessment Analysis, MARS Cable Route," dated May 3, 2004, and a summary of sedimentation rates for the Monterey Bay area (Lewis et al. 2002:162).

As discussed in the Project's geophysical survey report (Fugro 2004), Fugro Seafloor Surveys, Inc., conducted side scan sonar and sub-bottom profile surveys of a 3,280-foot (1,000-meter) wide corridor within which the MARS cable would be laid. Data collected in the Fugro survey was used to assess whether cultural resources (shipwrecks in particular) would be impacted by the Project. No such resources were identified in the

survey data. When making such an assessment, it is required by the Minerals Management Service, and customary in other cultural resource investigations, to include a magnetometer in the suite of survey instrumentation. This instrument was not included in the Fugro survey. Consequently, without additional data, it is not possible to ascertain whether ferrous-based material associated with historic cultural deposits, or evidence of prehistoric activities that may have created detectible variations in the local magnetic field, e.g., hearths, lie buried in or beneath the depositional bottom sediments.

At issue is whether magnetic data are necessary to determine potential Project impacts on such buried resources. Neither the side-scan sonar nor the sub-bottom profile data indicate that identifiable cultural resources exist in the survey corridor. However, the side scan sonar can only detect features (whether cultural or natural) that have a surficial expression. The sub-bottom profiler, while able to provide data about potential buried features, is transect-specific. That is, it can only provide data about the area that is directly below the sensor(s), with very little lateral coverage. Since the Fugro survey transects were spaced at intervals of either 300 or 600 meters (depending on water depth), significant portions of the survey corridor were not surveyed with this instrument.

To assess the likelihood that buried cultural resources may lie undetected in the bottom sediments, and whether such resources might be impacted by the project, a qualified marine archaeologist examined data relative to sedimentation rates in the Monterey Bay area (Lewis et al. 2002:162), as well as data pertinent to burial depths of the cable along the proposed route. It has been established that sediment in the area that encompasses the first ±24.5 miles (39.4 km) of the proposed cable route accumulates at the rate of approximately 3.9 mm/year. At this rate, over a 100-year period, approximately 40 cm (1.3 ft) of sediment accumulates in this segment of the proposed cable route (Perry Russell January 28, 2005, pers. comm.). Over a 300-year period, approximately 4 feet (1.2 meters) of sediment has accumulated over this area. According to Fugro Engineers BV, the first 24.5 miles (39.4 km) of the cable would be buried in a trough plowed to a maximum depth of 3.3 feet (1 meter) (Fugro 2004). In order for the plowing to impact cultural material undetected in the existing remote sensing data, the material would have to have been completely covered by sediment within the past 300 years. In the experience of the marine archaeologist, a significant historic cultural resource, such as a shipwreck, that sank (or was deposited) within the last 300 years would still retain sufficient structural integrity to have a surficial expression of at least 3.3 feet (1 meter) in height, and would therefore be detectible with side scan sonar. Since no features clearly identifiable as historic were observed in the side scan sonar data, it is reasonable to conclude that no historic resources, i.e., shipwrecks, are present within 1 meter of the surface of the seafloor. Consequently, a

magnetometer survey of the first 24.5 miles (39.4 km) of the cable route would not be necessary to supplement the remote sensing data conducted previously for the Project.

From approximately the 24.5-mile (39.4-km) mark along the cable route to the edge of the continental shelf at the ±29-mile (46.7-km) mark, the cable would either be buried in sediments less than 1 meter thick, or would not be buried at all and would lie on the exposed cemented clay or rocky substrate. Given the thin layer of sedimentation along this portion of the route, historic resources would not be buried so deep as to be undetectable in the side scan sonar data. Since none were identified, it is reasonable to conclude that there are no historic cultural resources along this portion of the route. Unidentified prehistoric resources, however, could be present.

Approximately 18,000 years ago, sea level was roughly 400 feet (122 m) lower than it is today, and would have been situated several miles west of today's coastline, placing it near the location of today's continental shelf break. Studies of the submerged shelf have mapped relic Late Pleistocene sediment deposits of sand and gravel that would have been exposed during times of lower sea level (Karl 2001). These deposits may be indicative of the location of submerged Paleoindian sites (Parkman 2004:36). Likewise, buried relic channel, river, or stream features where the terraces, point bars, or levees haven't been truncated by the transgression/regression process are also potential locations of submerged prehistoric sites (Jack Irion January 30, 2005, pers. comm.). These sensitive features could be present within the Project cable route.

Landing Area

The proposed landing site is a graded vacant lot west of Sandholdt Road in Moss Landing (Figure 2.1-9). An archaeological records search for Moss Landing was conducted by the Northwest Information Center at Sonoma State University on October 29, 2004 (Appendix E, Confidential). This search indicates that the landing site and adjacent areas have been surveyed for cultural resources with negative results (Breschini and Haversat 1985, included in Appendix E, Confidential). Other surveys of virtually the entire Moss Landing peninsula north of the Sandholdt Road Bridge have also yielded negative results (Appendix E, Confidential). The only cultural resource near the Project site is the Sandholdt Road Bridge over the Moss Landing Slough. A large number of prehistoric archaeological sites are found within ¼ mile (400 m) of Moss Landing in the immediate vicinity of Elkhorn Slough (Appendix E, Confidential).

In summary, the landing area contains no cultural resources.

4.3.2 Regulatory Setting

Federal

Section 106 of the National Historic Preservation Act (NHPA), as amended, requires Federal agencies to take into account the effects of their undertakings on historic properties, i.e., cultural resources that are listed in or potentially listed in the National Register of Historic Places, and afford the State Historic Preservation Office an opportunity to comment. The historic preservation review process mandated by Section 106 is outlined in regulations issued by the Advisory Council on Historic Preservation. These regulations, "Protection of Historic Properties" (Title 36 CFR Part 800), define effects on historic properties as follows:

> Section 800.5(a)(1): An undertaking has an effect on an historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the National Register. For the purpose of determining effect, alteration to features of a property's location, setting, or use may be relevant depending on a property's significant characteristics and should be considered.
>
> Section 800.5(a)(2): An undertaking is considered to have an adverse effect when the effect on an historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to:
>
> - Physical destruction, damage, or alteration of all or part of the property;
> - Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;
> - Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
> - Neglect of a property resulting in its deterioration or destruction; or
> - Transfer, lease, or sale of the property without adequate provisions to protect historic integrity.

Title 36 CFR Part 800.2(c)(2) addresses the consideration of Native Americans and other interested parties in the process of evaluating impacts on cultural resources. Any action that could directly or indirectly affect properties including archaeological sites,

biological habitats, or topographic features associated with Native American religious practices would be considered significant under these statutes.

State

The State CEQA Guidelines §15064.5 (14 CCR) indicate a project may have a significant environmental effect if it causes "substantial adverse change" in the significance of an "historical resource" or a "unique archaeological resource" as defined or referenced in 14 CCR §15064.5(b,c) (1998). Such changes include "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" (14 CCR §15064.5 [b]).

Local

The County of Monterey has adopted all statutory provisions of the California Environmental Quality Act (CEQA), as set forth in the California Public Resources Code (PRC), Division 13, Environmental Quality, §21000 et seq. These include all provisions that apply to cultural resources.

4.3.3 Significance Criteria

A cultural resources impact is considered significant if the Project adversely affects a resource that is:

- Listed in or eligible for listing in the California Register of Historical Resources,
- Otherwise considered a unique or important archaeological resource (including shipwrecks) under the CEQA, or
- Listed in or eligible for listing in the National Register of Historic Places (NRHP).

In general, a project may have an adverse effect on a cultural resource if the resource would be:

- Physically damaged or altered,
- Isolated from the context considered significant, or
- Affected by project elements that would be out of character with the significant property or its setting.

4.3.4 Impact Analysis and Mitigation

The Project's sea route was selected to avoid all known obstructions that might damage the cable, as well as to avoid damaging significant, or potentially significant, submerged cultural resources, including shipwrecks.

To assess the potential that unknown shipwrecks may be located in the project area, an analysis of sedimentation rates in the offshore study area was conducted. As described in Section 4.3.1, the sedimentation analysis determined that it is highly likely that a significant historic cultural resource, such as a shipwreck, that sank (or was deposited) within the last 300 years would still retain sufficient structural integrity to have a surficial expression at least 3.3 feet (1 m) in height, and would therefore be detectible with side scan sonar. Since no features clearly identifiable as historic were observed in the side scan sonar data, and since the proposed cable route has been designed to avoid any features that were identified, plowing to a depth of 3.3 feet (1 m) or less along the first 24.5 miles (39.5 km) of the proposed cable route would not impact historic resources deposited within the past 300 years. Historic or prehistoric cultural material buried 300 or more years ago, whether presently detectible or not, would be covered by more than 3.3 feet (1 m) of sediment and would not be impacted by project construction.

From approximately the 24.5-mile (39.4 km) mark along the cable route to the edge of the continental shelf at the ±29-mile (46.7 km) mark, the cable would either be buried in sediments less than 3.3 feet (1 m) thick, or would not be buried at all and would lie on the exposed cemented clay or rocky substrate. Given the thin layer of sedimentation along this portion of the route, historic resources would not be buried so deep as to be undetectable in the side scan sonar data. Since none were identified, it is reasonable to conclude that no historic cultural resources would be affected during plowing of this area.

Impact CR-1: Disturbance of prehistoric archaeological sites

The Project could disturb unknown prehistoric sites that lie along the sea route between the +24.5-mile (39.4-km) and +29.0-mile (46.7-km) marks. (Class II)

Installation of the Project cable would affect sediments to a depth of approximately 3.3 feet (1 m) below the surface of the seafloor. Based on sedimentation rates noted in Section 4.3.1, any prehistoric resources along the first 24.5 miles (39.4 km) of the proposed cable route would be buried too deeply to be affected by the cable. For this reason, there would also be no impacts in this section of the cable route during operation, e.g., to re-bury or repair a cable, or cable removal.

However, from approximately the 24.5-mile (39.4 km) mark along the cable route to the edge of the continental shelf at the +29-mile (46.7 km) mark, the cable would either be buried in sediments less than 3.3 feet (1 m) thick, or would not be buried at all and would lie on the exposed cemented clay or rocky substrate. Given the thin layer of sedimentation, any submerged prehistoric resources along this portion of the route could be affected by cable installation. The presence of such resources has not been demonstrated but cannot be disproved at the present time. Areas considered sensitive for submerged prehistoric resources include buried relic channels, rivers, or stream features where the terraces, point bars, or levees haven't been truncated by the transgression/regression process. These are potential locations of submerged prehistoric sites. If present, such resources could be permanently disturbed by cable installation. Post-construction activities to re-bury, repair, or remove the cable would not be expected to cause additional impact.

Mitigation Measures for Impact **CR-1**: Disturbance of prehistoric archaeological sites

MM CR-1. Review Existing Sub-Bottom Profiler Data. Review existing data from the sub-bottom profile and avoid any potential archeologically sensitive areas.

Areas sensitive for submerged prehistoric resources that could be affected by the Project may be located along the cable route between the 24.5-mile (39.4 km) mark and the +29-mile (46.7 km) mark. The existing sub-bottom profile data shall be re-examined by a qualified marine archaeologist and a geologist to determine whether deposits of sand and gravel, or relic channel, river, or stream features can be identified along that portion of the cable route (about 24.5 (39.4 km) to 29 miles (46.7 km) out) in which the cable would be laid on the exposed substrate, or in which plowing would affect areas with less than 3.3 feet (1 m) of sediment cover. If archaeologically sensitive features or areas are identified, the cable route shall be altered to avoid them. If that is not possible, the locations of any features that are not covered with sediment should be re-investigated with an ROV-mounted video camera to determine whether there is any artifactual evidence of prehistoric activity in those areas. If present, those areas shall be avoided. Implementation of Mitigation Measure CR-1 would avoid potential impacts on prehistoric resources.

A magnetometer survey of the cable route segment in question is not recommended to attempt the discovery of submerged prehistoric deposits, even though, theoretically, such deposits are detectible through their magnetic signature. Heat in the form of fire used in hearths can alter the magnetic signature of certain types of rock. The alteration would create a disturbance in the local magnetic field that could be identified in data

gathered with a magnetometer. However, the magnetic anomalies would be relatively small and would require a survey with extremely close transect intervals to identify. In order to identify such small and subtle variations in the local magnetic field, it would also be necessary to use a base station magnetometer to filter out the normal diurnal variation in the local magnetic field. Since the area of the cable route in question begins some 24.5 miles (39.4 km) offshore, use of an onshore base station to filter out this variation would be physically impossible. In addition, in order for it to be effective, the magnetometer's sensor would have to be towed within 20 feet (6.1 m) of the bottom, which would prove to be difficult, if not highly impractical in the approximate 295 feet (90 m) of seawater near the edge of the continental break.

Rationale for Mitigation

Avoidance is the standard mitigation for cultural resources. Additional review of the existing sub-bottom profile data would allow archaeologically sensitive seafloor areas to be identified and, if present, avoided.

Table 4.3-1. Summary of Cultural Resources Impacts and Mitigation Measures

Impact	Mitigation Measures
CR-1: The Project could disturb unknown prehistoric resources that may lie along the sea route between the +24.5 (39.4 km) and +29.0 (46.7 km) mile marks. (Class II)	**CR-1.** Review existing sub-bottom profiler data and avoid any potential archeologically sensitive areas.

4.3.5 Cumulative Impacts

The Project would avoid all archaeologically sensitive portions of the cable route and impacts are not expected to occur. None of the other cumulative projects are close to the archaeologically sensitive portion of the Project route and would not affect any submerged resources that may occur there. Based on these factors, there would be no contribution to cumulative impacts.

4.3.6 Alternative Landings

Alternative Landing Area 1: Duke Energy Pipeline to MBARI Property

Similar to the proposed Project, implementation of Alternative Landing Area 1 could disturb unknown prehistoric resources that may lie along the sea route. Therefore, the potential impacts of Alternative Landing Area 1 on marine cultural resources would be potentially significant and would require mitigation. Implementation of Mitigation Measure **MM CR-1** would avoid impacts on marine cultural resources (Class II). Moss

Landing contains no cultural resources, so there would be no additional impacts from this alternative.

Alternative Landing Area 2: Moss Landing Marine Laboratories (MLML) Pier

Similar to the proposed Project, implementation of Alternative Landing Area 2 could disturb unknown prehistoric resources that may lie along the sea route. Therefore, the potential impacts of Alternative Landing Area 2 on marine cultural resources would be potentially significant and would require mitigation. Implementation of Mitigation Measure **MM CR-1** would avoid impacts on marine cultural resources (Class II). Moss Landing contains no cultural resources, so there would be no additional impacts from this alternative.

No Project/Action Alternative

This alternative would have no impact on cultural resources.